



Safety Beacon



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Laser Hazards In Navigable Airspace

Beacon Newsletter Team

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Laser Targeting of Aircraft

An American Airlines 757 is on final approach to Boston Logan Airport's Runway 4 R after flying for nearly three hours in nighttime conditions, when the captain is suddenly hit with a dazzling green laser light that obliterates his vision! The laser beam had hit the captain's left eye with such intensity that he feels as if he has been "punched in the eye." He ducks down, closes his eyes, and tells the first officer he has been hit by a laser beam and not to look at the light. The pilot experiences pain, spasms, and spots in his vision. The flash was so bright that he believes the aircraft may be the target of a terrorist attack. So distraught by the event that occurred and visibly shaken, he gives up control of the aircraft to the first officer, who, fortunately, has not been hit by the laser beam and is able to land the plane successfully.

The captain's symptoms persist that night. Upon waking in the morning, he perceives that the vision in his left eye is noticeably more blurred with or without his glasses, and his "eye hurts and feels strained." The pilot goes to an eye doctor that afternoon and is diagnosed with accommodative spasm, sluggish pupil responses, and increased light sensitivity, which continue for several days before finally clearing up. For a while, though, the pilot thinks that his flying days may be over.

This laser incident is fictitious but is based on actual events and personal interviews with pilots that have been exposed to laser beams while flying here in the United States. Although lasers have many legitimate outdoor uses, such as in astronomical research, deep-space communications, orbital satellite imaging, and outdoor displays to attract and entertain the public, the misuse of laser devices poses a serious threat to aviation safety. Aviators are particularly vulnerable to laser illuminations when conducting low-level flight operations at night. The irresponsible or malicious use of laser devices can threaten the lives of flight crews and passengers.

On the web: www.wickedlasers.com



Continued...

Laser Targeting of Aircraft

Why Should I Be Concerned?

Federal Aviation Administration (FAA) researchers have compiled a database containing more than 3,000 reports of aircraft laser illumination events over a 20-year period. These reports describe the illumination of military and civilian aircraft by lasers, including law enforcement and medical evacuation flights. No accidents have been attributed to the illumination of crewmembers by lasers, but given the sizeable number of reports and debilitating effects that can accompany such events, the potential does exist.

Sudden exposure to laser radiation during a critical phase of flight, such as on approach to landing or departure, can distract or disorient a pilot and cause temporary visual impairment. Permanent ocular damage is unlikely since the majority of incidents are brief and the eye's blink response further limits exposure. In addition, considerable distances often are involved, and atmospheric attenuation dissipates much of the radiant energy.

FAA flight simulator studies, however, have shown the adverse visual effects from laser exposure are especially debilitating when the eyes are adapted to the low-light level of a cockpit at night. Similar to a camera flash at close proximity or the high-beam headlights of an oncoming car, recovering optimal visual performance after exposure to laser light may take from a few seconds to several minutes. Besides startle and distraction, the three most commonly reported physiological effects associated with laser exposures are:

Glare – Obscuration of an object in a person's field of vision due to a bright light source located near the same line of sight.

Flash blindness – A visual interference effect that persists after the source of illumination has been removed.

Afterimage – A transient image left in the visual field after an exposure to a bright light.

Is Anything Being Done?

In 1995, an increase in the number of laser illuminations (mostly from laser light shows) resulting in the disruption of cockpit operations, prompted the FAA to revise FAA Order 7400.2 (Part 6. Miscellaneous Procedures: Outdoor Laser Operations). The revised Order established exposure limits to prevent temporary visual impairment in three new zones that become more restrictive at lower attitude and closer proximity to airport runways. The new zones and exposure limits include:

Sensitive Flight Zone – 100 microwatt per square centimeter ($\mu\text{W}/\text{cm}^2$), **Critical Flight Zone** – $5 \mu\text{W}/\text{cm}^2$, and **Laser Free Zone** – 50 nanowatts per square centimeter (nW/cm^2).

While FAA Order 7400.2 has all but eliminated reports of incidents associated with legitimate laser operators, such guidelines cannot prevent misuse due to ignorance or maliciousness. Inappropriate use of lasers has become more prevalent and dangerous as handheld lasers have become less expensive, more powerful, and increasingly available to the general public.

On January 12, 2005, in response to the rapid increase in laser illumination reports involving aircraft, the Department of Transportation published advisory circular AC 70-2 entitled, "Reporting of Laser Illumination of Aircraft." This document provides mitigation procedures and information on how to report laser illumination events. In addition to providing an official reporting mechanism, AC 70-2 also improved coordination between local and federal law enforcement agencies responsible for the apprehension and prosecution of violators. Frequently, prompt reporting has led to the capture of perpetrators.

For more information, check out: www.faa.gov

Message From The National Safety OFFICER



Col Robert Diduch, CAP

"All members should put their best foot forward and not only think safe but be safe."

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I would like to remind all members that they must complete the current introductory safety education module. Introduction to CAP Safety for New Members, by 31 March 2011.

This includes all members that have previously completed the Basic Safety Course or have earned a specialty track rating in safety.

Folks,

As we transition into 2011, Civil Air Patrol is continuing its effort to improve its safety culture for all participating members.

To participate in any CAP activity, a member must be compliant in accordance with the current policy of CAP. This will take everyone's effort to bring awareness to the forefront. The current policy can be viewed at:

(http://www.capmembers.com/media/cms/2010_11_03_safety_education_and_OR_0E855E8029EC2.pdf)

There are a multitude of options available for CAP members to ensure their monthly safety education compliance. Options include the following:

· **ONLINE COMPUTER BASED SAFETY EDUCATION:** Please sign-in to eServices. On the left side, in the lower area of the **"My Favorites"** column will be a section entitled **"Online Safety Education"**. Click on it; a number of safety course titles will appear; click on a title; and, begin a course. When the course has been successfully completed, please make sure directions to ensure course credit. The individual's safety education report will appear in the lower section of the page. This can be checked often to ensure compliance. This method will provide CAP members automatic accreditation for the courses that are completed. Safety education is once per month; do not take all the courses at once.



Safety is important and should be an integrated value of how we operated in our day-to-day mission and being prepared, ahead of time, is the foundation for CAP's motto, "Semper Vigilans" - Always Vigilant.

As always, your cooperation is appreciated.

Col Robert Diduch

Looking for Safety Classes to Satisfy Your Monthly Requirement?

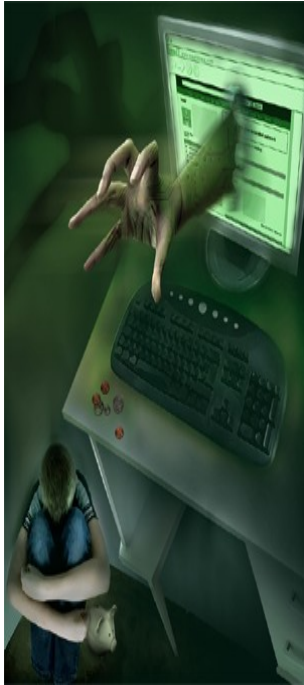
by Lt Col Bruce Brown, Assistant National Safety Officer, Aircraft

Many of you are aware of recent safety changes voted into policy by the National Board. These include relaxing attendance at physical safety meetings and allows commanders to certify relevant safety meeting attendance from non-CAP safety education as meeting the CAP requirement. Two key elements must be understood when taking non-CAP safety courses for CAP monthly safety education credit:

- 1) The content must be relevant to CAP activities or one of its mission areas.
- 2) There must be a way to validate completion of the class so that the unit commander can approve it in lieu of a CAP safety education class. A completion certificate is one way of meeting this requirement.

National HQ is currently populating the safety website with monthly briefings that members can take for credit, however we can't upload enough courses to keep up with demand. For pilots and aircrew, there is another option for flight safety interactive courses from AOPA's Air Safety Foundation. Go to the website: http://www.aopa.org/asf/online_courses/. Make sure you are on the "Interactive Courses" tab and select any of 35 (as of press time) AOPA and Air Safety Foundation-approved classes. Take these for CAP and FAA credit and print out your completion certificate. During this changeable time of year (winter to spring) I would like to recommend the refresher classes on "Ceilings and Visibilities", "Air Masses and Fronts", and "Precipitation and Icing." There are case studies and simulations for you, too.

Regardless of your experience level and interest, there are courses that offer something for nearly every pilot. Using this additional resource will help keep you current for monthly safety education and will actually keep your "pilot sword" sharpened!



Wikispaces.psu.edu

What To Do When Your Child Is the Victim of Cyber bullying

By Michelle Menillo - [NetSmartz](#)

These are children whose names have become inextricably linked to the issue of cyber bullying. Their pictures and stories have been plastered across newspapers, magazines, YouTube videos, and web memorials denouncing cyber bullies and mourning the victims. Their families have taken their stories public in order to fight this growing trend among adolescents. Although these names represent a minority of victims who committed suicide due, at least in part, to cyberbullying, there is a multitude of other victims whose stories have not been told, children who continue to face cyber bullying everyday.

Who is best suited to tell their stories?

Ignore the message.

Don't ignore the problem.

The NetSmartz® Workshop advocates three simple rules for children facing cyber bullies.

.Don 't respond to the message.

.Save the evidence.

.Tell a trusted adult.

These rules can prevent cyber bullying from escalating, and also can prevent the victims from becoming cyber bullies themselves. It seems so easy to trade insults over IM, write mean messages on someone's social networking page, or trash-talk while gaming because children are generally unconcerned with future conse-

quences. Ryan Halligan, Jeffrey Johnston, and Megan Meier are all startling examples of what happens when people do not consider the consequences of their actions.

One vital lesson NetSmartz wants children to learn is to ignore the message, not the problem. As parents, you have an ideal opportunity to step in and encourage children suffering from cyber bullying to speak out and fight this kind of victimization. *They* are best suited to tell their own stories, and their stories *can* make a difference.

Educate your children about cyber bullying.

Engage them in the fight against cyber bullying.

Empower them to lead the fight against cyber bullying.

www.education.com

HOME SAFETY: PREVENTING BURNS, CUTS and MORE

WEBMD MEDICAL REFERENCE

REVIEWED BY BRUNILDA NAZARIO, MD



Home Safety: Tips for Preventing Falls

Falls are the No. 1 cause of home injuries and death in the U.S., according to the Home Safety Council. The two groups most at risk for falls are children younger than 5 and adults over the age of 70. Try these strategies to prevent falls at home:

Accidents happen, right? Not necessarily. In fact, some of the most common injuries that occur at home don't have to happen.

About one-third of all injuries happen in the home, and they tend to hit small children and elderly adults most. This guide will help you prevent five common home injuries: falls, choking and suffocation, burns, poisoning, and knife cuts. While the injuries can be serious or even fatal, preventing them generally just takes a little thought and time.

Make the bathroom a no-slip zone. Install grab bars and non-slip mats or appliqués in the tub or shower. Use a bathmat with a nonskid bottom and cleanup any water that splashes on floors right away.

Safety-proof stairs. Remove clutter from stairs and walkways. Stairs inside and outside should have handrails, preferably on both sides. Have good lighting over stairs.

Toss the throw rugs. Throw rugs are a big tripping hazard for young and Old people. At the very least, tape or tack them to the floor.

Leave a light on. Ideally, have night-lights in bedrooms, bathrooms, and halls.

PREVENTING BURNS WHILE COOKING

Here are a few tips to help you make your kitchen a safer place. Stay in the kitchen while cooking.

- . Turn pot handles toward the back of the stove.
- . Keep items such as a dish towels, plastic bags, and long sleeves away from heating surface.
- . Never cook while holding a child or pet.
- . Keep small children and pets away from the front of the oven or stove.

continued...

HOME SAFETY: PREVENTING BURNS, CUTS and MORE

PREVENTING CHOKING AND SUFFOCATION

Keep children safe with strategies such as these:

Do the “toilet tube” test. Babies and toddlers like to put things in their mouths. Anything that can fit through a toilet tube—coins, marbles, buttons, jewelry, uninflated balloons—is a choking risk. Keep items that don’t pass the test away from children.

Do house checks often. Look under beds, on top of shelves, and in between sofa cushions for stray bottle caps,, nails, safety pins, erasers, refrigerator magnets, broken crayons, and other small items that are choking hazards.

Keep strings out of sight. Remove drawstrings from children’s clothing. Tie up window cords well out of children’s reach.

Be vigilant about plastic bags. Get rid of dry-cleaning and shopping bags immediately. Keep household plastics bags out of reach.

PREVENT POISONING

About 90% of poison exposures happen at home, making it the second leading cause of accidental death in the home.

Know your poisons. Poisons come in many forms: cosmetics, garden products such as fertilizer, furniture polish, dishwasher detergent, and carbon monoxide from burning fuel.

Buy wisely. Purchase products with child safety lids, whenever you can.

Store safely. Put any product with a warning label up high and in a locked cabinet. Don’t keep medicines in your purse, pockets, or drawer. Keep products in their original containers. Do not use food containers for storage.

Watch your children. According to the American Academy of Pediatrics, most child poisonings occur when parents are cooking dinner or not watching their children closely for other reasons.

Keep carbon monoxide outside. Have heaters, stoves and fireplaces checked by a professional every year. Carbon monoxide can also enter the house through an adjoining garage. Never run an engine or car motor or use a barbeque in the garage.

Safe Use of Kitchen Knives

Keep your eyes on your cutting. It’s easy to get distracted by children, TV, and telephones when preparing meals.

Let falling knives fall. Don’t try to catch a knife. Step back and let it go.

Watch where you put down a knife. Keep knives away from the edge of a cutting board or counter. Don’t throw a towel or napkin on top of a knife so that you can see it. Never leave a knife in a sink or soapy water, where someone may reach it without looking and grab the blade. Clean, dry and put away a knife after use it.



“SLEEP DEPRIVATION - one form of FATIGUE IN AVIATION”

“My mind clicks on and off...I try letting one eyelid close at a time while I prop the other open with my will. But the effort’s too much. Sleep is winning. My whole body argues dully that nothing, nothing life can attain, is quite so desirable as sleep.”

– Charles Lindbergh, describing the fatigue that struck him 9 hours into his 33-hour solo Atlantic crossing.

At one time or another, we’ve all experienced an overwhelming desire to sleep. It’s the most pronounced symptom of fatigue, and it’s a decidedly uncomfortable feeling when you’re at the controls of an airplane.

In reality, though, there’s more to it than the risk of dozing off in the cockpit. “Fatigue” is a catch-all term for an often insidious condition that can degrade pilot performance in a number of different areas, from vision and coordination to memory, concentration, mood, and judgment. [One form of Fatigue is severe sleep deprivation. This article focuses on this form of fatigue.]

A study published in *Nature* magazine showed that people who stay awake for 17 hours straight function at a level similar to those with a blood-alcohol content of 0.05 percent—beyond the legal limit for flying.

In this Safety Brief, we’ll look at some of the things that can lead to fatigue, and some steps you can take to keep it from catching up with you in the cockpit.

Sleep Issues

The most obvious cause of fatigue is a lack of sleep. Different people need different amounts of sleep, but for most adults the critical amount is between seven and eight hours a night. Modern life being what it is, though, it’s easy to get less than you need...and if “run-down” becomes “normal,” you may not realize how diminished your faculties have become. Difficult as it can be, though, the only real cure is getting a full night’s rest on a consistent basis: One good night of sleep won’t make up



Still, quantity and quality of sleep aren’t always the same thing. That’s true for several reasons, one of which is the fact that the human body has its own internal clock, a “circadian rhythm” set by external cues (primarily daylight and darkness). It’s the reason why we’re generally sleepy at night and active during the day. It’s not difficult to throw your clock out of sync. Pilots of fast, long-range aircraft can easily cross several time zones in a single bound, disrupting their circadian rhythms and miring themselves in a groggy, low-energy state commonly known as jet lag.

Sleeping Smart

Here are a few tips that can help you get the best sleep possible:

- Avoid exercise within two to three hours of bedtime.
- Avoid caffeine and alcohol within four to five hours of bedtime.
- Eat a light snack before you turn in. Don’t go to bed hungry or full.

Daytime Sleep

If you need to sleep during the day, take some time to mentally “unwind” before you go to bed. Darken the room as much as possible, or wear eye shades; you may also want to wear ear plugs or use a white-noise generator. Finally, lower the thermostat: It’s easier to sleep in a cool room.



But jet lag isn't the only way to end up at cross-purposes with your body's clock. For general aviation pilots, end-of-the-day flights more often are the problem. Here's a common scenario: A pilot makes an early morning departure, flies several hours, spends the day in a meeting, and then flies home the same evening.

That may not sound so bad—but take a closer look. It's easy to gloss over all the little things that can cause stress and fatigue on such a trip, but those "little things" add up, and their cumulative impact can be tremendous. Consider just a few of the potential problems. It can be difficult to sleep the night before an important trip.

Preparing for a cross-country flight can be stressful, particularly if the weather is marginal and it's important to get to the destination. There always seem to be delays: airplanes have mechanical problems; weather leads to ATC reroutes; or rental car reservations get mixed up. To make up for lost time, meals get skipped. And that's just getting to the meeting, which may itself involve conflict and difficult decisions. With that in mind, take another look at the situation. By the time the meeting is finished, the pilot will have been awake for more than 12 stressful hours (a good portion of which was spent at altitude). Now he or she will be flying single-pilot IFR, at night, in a high-performance airplane—and doing it at a time when the body naturally wants to "call it a day." It's a situation that can easily demand more than a pilot is physically or mentally able to give. Family travel can be just as fatiguing. Many of the same issues that crop up on business trips—passenger expectations, or pressure to get home before a certain time—also cause trouble for pilots who fly cross-country for the holidays, or take the airplane on vacation. The circumstances are very different, but the factors that lead to fatigue are much the same.



Especially when flying single-pilot, avoid late-night flights.



Simple as it sounds, the best advice is to stick to as normal a schedule as possible. Don't put yourself in "need to get home" situations. If you know it's going to be a long day, plan to spend the night and depart the following morning. Avoid flights that arrive after 10 p.m., and if you can't, make an effort to get plenty of preemptive rest and consider bringing another pilot along to help out. Whatever the situation, remember that the flight can always be delayed. If you feel any serious concern about your level of fatigue, *stay on the ground.*

Power Naps

If you're feeling drowsy, a short nap of 15 or 20 minutes can be a very effective way to regain alertness and decision making ability. It's generally best to keep naps short in order to avoid entering the deep part of the sleep cycle. Longer naps, and naps taken during normal sleeping hours, i.e., at night, often lead to more severe "sleep inertia"—that groggy, drowsy feeling after you wake up.

Dehydration • Drink plenty of fluids throughout the day

• Bring a bottle of water with you

Hunger/Digestion • Eat several small meals during the day

• Keep a few snacks in your flight bag

• Avoid large meals before flights

Cockpit Environment • Use a noise-cancelling headset

• Bring a passenger: It's easier to stay awake when you have someone to talk to

• Even better, bring another pilot to lend a hand

Illness • Be honest with yourself about how well you'll be able to perform

• Be prepared to cancel the flight

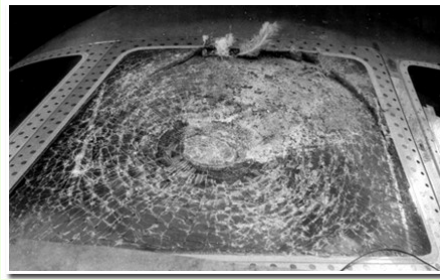
Medication • Check that the medication is FAA-approved, and follow any warning labels

• Be extra cautious if it's your first time taking the medication

Hypoxia • Avoid flying above 5,000 msl at night without oxygen, 10,000 msl during the day

• Learn to recognize the signs of hypoxia

• Be particularly cautious if you're a smoker



The image above is scenic only at first glance. Facing a huge flock of birds during takeoff or landing will evoke sweaty palms in most pilots – and passengers probably. Though the majority of bird-strikes cause little damage to a plane, they do result in a great number of bird fatalities and cause annual damages estimated at \$400 million in the U.S. alone and \$1.2 billion worldwide.

According to a confidential database managed by NASA, the years from 1990 to 2007 saw almost 80,000 reported incidents of birds striking nonmilitary aircraft, resulting in emergency landings, aborted takeoffs or close calls - and these are just the voluntarily reported incidents.

A single bird, caught in a plane's engine, can cause quite a bit of damage and might even force an emergency landing. But especially dangerous for planes (and birds!) is getting into the middle of a whole flock. Therefore, bird migration routes should be avoided but some locations have a higher risk: Sacramento International Airport, for example, has more instances of bird-strike than other airports as it is located along the Pacific Flyway, a major bird migration path. The whole of Israel is also on a major **spring and autumn** long-distance bird migration route and is therefore at a higher risk of bird-strike.

No single measure has yet proven to be the most effective and new strategies are being developed, especially for bird management at airports. Efforts have included reducing the attractiveness of an airport's surroundings for birds, like the removal of tall trees, the birds' preferred roosting places at night. Other measures include scaring the birds away through sound, light, lasers, pyrotechnics, decoy animals and dogs, but also falcons.

Improving pilots' training in wildlife avoidance seems like a worthwhile measure as currently, little training is spent on what to do when faced with a flock of birds. In case you were wondering, the thing to do is to quickly climb above 3,000 ft as most bird-strikes occur below that height. Pilots should also slow their aircraft to reduce the impact in case of a collision and the rotation of the engine.

www.environmentalgraffitti.com

VISIT US ON THE WEB
WWW.GOCIVILAIRPATROL
.COM

Until Next Month

Discover, report, stop, share, listen, and learn. The things we have read about in this issue already have happened, so you are not allowed to experience these for yourself.

Remember to “Knock It Off” and slow down. For streaming dialogues on some subjects, remember CAP Safety is on Facebook and Twitter.

SAFETY DAY CHANGE—MARK IT DOWN:

Just another reminder - There has been a policy change that will require an annual SAFETY DAY to be held during the months of January, February, or March, in lieu of the old policy requirement to hold one in October. The policy implementation date for this will begin in January, February, and March of 2012.

SUMMARY

CAP's safety awareness and program management has significantly improved with the addition of NHQ safety staff working in conjunction with the National Safety Team (NST). The NST is comprised of the National Safety Officer and volunteer assistants assigned as subject matter experts for flight and ground safety. Region and Wing Commanders are moving away from a punitive safety program towards a behavior-based safety program that has shown significant improvement in using safety mishaps as an educational opportunity to raise awareness and prevent risk exposure.

Got a great safety article that you would like to see in a future Beacon newsletter?
Please send it to Lt Col Sharon Williams at safetybeacon@capnhq.gov.



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